March 17, 2010
GFK-1005G

IMPORTANT PRODUCT INFORMATION

TCP/IP USERS–READ THIS INFORMATION FIRST

Product: **Factory LAN TCP/IP Ethernet Controller for IC697 Programmable Controllers**
IC697CMM741M

Factory LAN TCP/IP Ethernet Software for IC697 Programmable Controllers
IC651ENS042E
CE651ENS042E

Firmware Identification
Version 2.03

Software Identification
IC651ENS042E, diskette version 1.04
CE651ENS042E, diskette version 1.04
Release diskette consists of:
TCP/IP Ethernet Executive software, version 2.12
TCP/IP Ethernet Configuration editor, version 1.06
GSM, version 2.14

This document contains important user information for the most recent releases of both the firmware and the TCP/IP (Transmission Control Protocol and Internet Protocol) software of the Factory LAN Ethernet Interface (IC697CMM741). The firmware provides a means for loading and executing either TCP/IP Ethernet software (IC651ENS042 / CE651ENS042) or MMS-Ethernet software (IC651ENS040 / IC651ENS041).

When installed on an IC697CMM741 Ethernet Interface in an IC697 PLC, the TCP/IP software provides a means for network communications over an Ethernet Local Area Network (LAN) between the IC697 PLC and TCP/IP Host Communications software (IC641SWP052, IC641SWP053, IC641SWP054, IC641SWP055, IC641SWP057, and IC641SWP058), between the IC697 PLC and IC641 TCP/IP (IC641SWP713), and/or between two IC697 PLCs. This allows intercommunication between an IC697 ladder program and either a remote IC697 Ethernet Interface (IC697CMM741) or IC693 Ethernet Interface (IC693CMM321).

Field upgrade kit: 44A731219-G07 [2 EPROMS: (U70) 388-003J2.03 and (U71) 388-004J2.03]

Documentation: User's Manual: *TCP/IP Ethernet Communications User's Manual*.
Data Sheet: Ethernet LAN Controller.

New for This Release

New software features are highlighted below.

New Station Manager Command: “killss”

A new station manager command "killss" has been added in this release of the IC697CMM741 TCP/IP Software. The command “killss” is used to terminate established SRTP Server endpoints. Refer to the section "Operational Notes" for details.

Enhanced Station Manager Output: “stat v”

To help in debugging a PLC setup, the number of received requests and the IP address of the client for every SRTP Server endpoint have been added to the display in response to “`stat v`” station manager command.

Automatic Termination of Hung SRTP Server Endpoints While Opening or Closing

A keep-alive mechanism has been added to the SRTP Server to automatically terminate endpoints which remain inactive for a time out period of approximately 30 to 60 seconds while being opened or closed. This prevents SRTP Server endpoints from remaining hung forever and causing new connection requests to fail until the Ethernet Interface is either restarted or power cycled.

New TCP ‘NoPorts’ Tally

A new TCP tally has been added: ‘NoPorts’. This tally counts the number of received TCP frames which are addressed to TCP ports which are not open, i.e. TCP ports which the Ethernet Interface software is not using.

Compatibility

General compatibility notes:

- The IC697CMM741M firmware (version 2.03) will operate with either TCP/IP software (IC651ENS042 or CE651ENS042) or MMS-Ethernet software (IC651ENS040 or IC651ENS041).
- The IC651ENS042 and CE651ENS042 TCP/IP software may be installed into the same GSM directory with IC651ENS040 and IC651ENS041. Once installed in the same directory, the GSM will support configuration and downloading of either the MMS-Ethernet software or the TCP/IP Ethernet software according to operator selection for each station.
- Compatible (when operating as a responder) with all versions of the Host Communications Toolkit software on all available platforms:
    - Toolkit for Windows NT® C/C++ Applications (IC641SWP058), the Host Communications Toolkit software for the Microsoft Windows NT environment.
    - Toolkit for Windows® C/C++ Applications (IC641SWP052), the Host Communications Toolkit software for C/C++ applications in the Microsoft® Windows® for Workgroups environment.
    - Toolkit for Windows Visual Basic® Applications (IC641SWP055), the Host Communications Toolkit software for Visual BASIC applications in the Microsoft Windows for Workgroups environment.
    - Toolkit for HP-UX C Applications (IC641SWP054), the Host Communications Toolkit software for the HP-UX 9000 workstation environment.
    - Toolkit for DEC VAX/VMS™ C Applications (IC641SWP053), the Host Communications Toolkit software for the DEC VAX/VMS workstation environment.

- Toolkit for DEC Alpha AXP™/VMS C/C++ Applications (IC641SWP057), the Host Communications Toolkit software for C/C++ applications in the DEC Alpha AXP/VMS workstation environment.

The IC651ENS042/CE651ENS042 TCP/IP Ethernet software when operating as a client (requestor) may use either of two configuration modes as set using IC641 configuration software. (See *Operational Notes* below: "TCP/IP configuration mode" or "MMS-Ethernet configuration mode".) TCP/IP configuration mode *requires* at least Ethernet Interface firmware version 2.00 and software version 2.00 as well as a higher minimum CPU and IC641 configuration software version number.

The following minimum CPU and IC641 configuration software version numbers apply for the IC697 Ethernet Interface while using IC641 programming software in "TCP/IP configuration mode".

CPU model	CPU f/w	IC641SWP s/w	IC641CTL s/w	Ethernet Interface†	Ethernet Interface firmware†	Ethernet Interface TCP software‡*
731/732	5.03	6.02	1.00	IC697CMM741K	version 2.00	version 2.00
771/772	5.03	6.02	1.00	IC697CMM741K	version 2.00	version 2.00
780	N/A	N/A	N/A	N/A	N/A	N/A
788/789	N/A	N/A	N/A	N/A	N/A	N/A
781/782	5.50	6.02	1.00	IC697CMM741K	version 2.00	version 2.00
914/915	5.50	6.02	1.00	IC697CMM741K	version 2.00	version 2.00
924/925	6.00	6.02	1.00	IC697CMM741K	version 2.00	version 2.00

† See the *Field Upgrade Kit* description above for information on upgrading existing Ethernet Interfaces.
‡ By "Ethernet Interface TCP software", we mean either IC651ENS042 or CE651ENS042.
* Version 2.10 is required to support the "Unsolicited Messages" feature.

The following minimum CPU and IC641 version numbers apply for the IC697 Ethernet Interface while using IC641 programming software in "MMS-Ethernet configuration mode". This configuration mode is the only way for CPU 780, CPU 788, or CPU 789 customers to use client/server functions. For all other CPU models, TCP/IP configuration mode, as described above, will provide simpler operation.

CPU model	CPU f/w	IC641SWP s/w	IC641CTL s/w	Ethernet Interface†	Ethernet Interface firmware†	Ethernet Interface TCP software‡*
731/732	4.12	5.01	1.00	IC697CMM741K	version 2.00	version 2.00
771/772	4.12	5.01	1.00	IC697CMM741K	version 2.00	version 2.00
780	4.60	5.01	1.00	IC697CMM741K	version 2.00	version 2.00
788/789	5.01	5.01	1.00	IC697CMM741K	version 2.00	version 2.00
781/782	4.12	5.01	1.00	IC697CMM741K	version 2.00	version 2.00
914	4.14	5.01	1.00	IC697CMM741K	version 2.00	version 2.00
915/925	6.00	6.02	1.00	IC697CMM741K	version 2.00	version 2.00

† See the *Field Upgrade Kit* description above for information on upgrading existing Ethernet Interfaces.
‡ By "Ethernet Interface software", we mean either IC651ENS042 or CE651ENS042.
* Version 2.10 is required to support the "Unsolicited Messages" feature.

Please note that using MMS-Ethernet configuration mode requires the user to program an additional (Assign Channel Status Vector) COMMREQ function to be able to use the sixty-four (64) Channel Status bits. Refer to the User's Manual for more details.

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Operational Notes

IC641SWP Programming Software Configuration Modes

Warning

IC641SWP programming software version 6.01 *must not* be used to configure an Ethernet Interface. If this version was used to configure an Ethernet Interface, operation of the Ethernet Interface may be unpredictable and possibly unsafe.

If you have used IC641SWP programming software version 6.01 to configure an Ethernet Interface, you must install version 6.02 or later. Then delete the Ethernet module configuration, and re-enter it using version 6.02; do not attempt to edit the version 6.01 configuration with version 6.02.

IC641SWP programming software version 6.02 provides the user with two modes of operation for the TCP/IP Ethernet software (IC651ENS042/CE651ENS042): "TCP/IP configuration mode" and "MMS-Ethernet configuration mode:

TCP/IP Configuration Mode

This is the default mode when configuring the Ethernet Interface (IC697CMM741) using IC641SWP programming software version 6.02. This provides a means of specifying the Internet Protocol (IP) address of the Ethernet Module, as well as specifying related IP addressing data. Support of this mode requires IC697 PLC CPU version 5.03/5.50 or later and IC651ENS042B/CE651ENS042B. In this mode, the status bits location configured will be for eighty (80) bits: sixteen (16) LAN Interface Status bits and sixty-four (64) Channel Status bits.

MMS-Ethernet Configuration Mode

Release 5 IC641SWP programming software uses MMS-Ethernet configuration mode exclusively. Release 6 IC641SWP programming software adds TCP/IP configuration mode as a second choice. Configuring the Ethernet Interface (IC697CMM741) using MMS-ETHERNET mode allows for support for MMS-Ethernet RAM software (IC651ENS040/IC651ENS041) or TCP/IP RAM software (IC651ENS042/CE651ENS042). Configuring in this mode also allows IC697 PLCs with CPU models that cannot support version 5.03/5.50 or later (such as CPU 780) to be able to use COMMREQs directed to TCP/IP Ethernet software (IC651ENS042B/CE651ENS042B). In this mode, the status bits location configured will be for only sixteen (16) LAN Interface Status bits. In this mode, if client (requestor) functions are to be used, the user's ladder program must specify where the sixty-four (64) Channel Status bits go, using the Assign Channel Status Vector COMMREQ. See the User's Manual for more details.

Must Not Use TCP/IP Config Mode with Older Firmware/Software

Ethernet Interface firmware version 1.15 (or earlier) and software 1.28 (or earlier) *cannot* support TCP/IP configuration mode. Numerous problems will occur if this is attempted. For example, the Ethernet Interface may not recognize PLC CPU RUN/STOP transitions and the Ethernet server task may not initialize if PROM 1.15 or RAM 1.28 is used with TCP/IP configuration mode.

Modification to Existing GSM Configuration File to Reduce the Likelihood of Encountering LLC tally MisdPack

In order to reduce the likelihood of LLC tally MisdPack, there were two changes made to the configuration file generated by the version 1.06 TCP/IP configuration editor. The first change was to change the default LLC receive ring length to 128 (from 64). The second change was to change the default buffer allocation percentages for pool3 and pool4, which was required due to the first change. Any new station configuration created using version 1.06 of the TCP/IP configuration editor will automatically receive the new values. To have these changes take effect with an existing GSM configuration file, you must perform the following steps *for every existing station configuration*:

1. Install the new GSM and configuration editor version 1.06.
2. From the GSM main menu, select the "Configure a Station" menu. Enter the station name in the STATION_NAME field and press Enter. Record the MAC address of this station.
3. Enter ALT-E. This will bring up the IC697 TCP/IP configuration editor menu. *The version number of the TCP/IP configuration editor is shown on the screen.*
4. Select *Advanced Parameters* by pressing the DOWN-ARROW key once, and then the ENTER key once.
5. Select *Data Link Parameters* by pressing the ENTER key once.
6. Select *RX_RING_LEN* by pressing the ENTER key once.
7. Press the TAB key as many times as necessary until the number shown on the screen is 128.
8. Enter ALT-U to save this change.
9. Select *System Parameters* by pressing the DOWN-ARROW key once, and then the ENTER key once.
10. If you are using default buffer pool allocation parameters, change the default allocation for buffer pool 3 to 58%, and pool 4 to 19%. If you have previously customized these parameters, increase the percentage of pool 3 so the number of buffers in pool 3 increases by at least 64 (to at least 144). Of course, this means the other pools would have to be decreased.
11. Enter ALT-U to save this change.
12. Repeatedly press ALT-U until you are back at the main GSM menu.
13. Put the target Ethernet Interface into a state where it is asking for a GSM download (you could use the GSM's "Access Station Manager" menu and enter the "LOAD" Station Manager command, or use the push-button on the Ethernet Interface itself by pressing and holding the push-button down until the *STATUS* LED is lit).
14. Select the "Download Station" menu from the main GSM menu. This will allow the latest TCP configuration parameters and the latest TCP/IP executive software to be downloaded into the Ethernet Interface's RAM.
15. You are now ready to start using the enhanced capabilities of the new TCP/IP software.

Note

On extremely heavily loaded LAN, it is still possible to occasionally tally MisdPack even after these changes have been made in the Ethernet Interfaces (IC697CMM741). This merely signals that an Ethernet frame has been lost and is provided to the user as an indication of the network's health.

If the Ethernet Interface using an existing configuration does not record tallies, it is not necessary to make these changes in the existing GSM configuration file. However, any new Ethernet Interface configurations created by the version 1.06 of the TCP/IP configuration editor will default to the new values.

TCP/IP Capacity Limitations

The IC697 Ethernet Interface (IC697CMM741) has a limited amount of RAM available after downloading the TCP/IP software (IC651ENS042 or CE651ENS042). This limits what processing can be done by the TCP/IP software, especially when it comes to the number of simultaneous connections and the amount of data being passed on each connection. GE Intelligent Platforms strongly recommends limiting your application to:

- Use no more than one (1) connection, if passing 2,048 bytes per message.
- Use no more than eight (8) simultaneous connections, if passing 1,024 bytes per message on all connections.

Passing 512 bytes or less per message on all connections should allow you to use up to the maximum of sixteen (16) simultaneous connections.

The consequences for exceeding these limitations can be severe. Problems known to occur when these limitations are exceeded are:

1. When the client PLC CPU transitions from RUN to STOP, some TCP connections are left in a FIN-WAIT-1 state. Consequently, the 16 “available” connections, at both the client and the server, are reduced by the number of such connections until the Ethernet Interface is restarted or power cycled.
2. Space to pass messages to the PLC CPU is exceeded, causing all connections to see requests fail due to resource problems. This can cause loss of data and TCP connections to be aborted.

Using IC641 programming software may impose further limits on the Ethernet Interface. Performing an IC641 programming software load or store to the PLC CPU in the same rack as the Ethernet Interface limits the Interface to:

- Using no more than eight (8) simultaneous channels if passing 256 bytes per message on all connections.
- Using no channels (i.e. - pass data to Ethernet Interface acting as a server only) if passing 512 bytes per message on all connections..

Data Transfer with One Repetition can Exhaust TCP Connections

If your ladder program for issuing COMMREQs is constructed so it does all the following, all available TCP connections can quickly be used up:

- The number of repetitions (word 9 in an Establish Channel COMMREQ) is set to 1 and a new COMMREQ is issued immediately upon completion of the prior one.
- Each successive COMMREQ is directed to the same target device (same IP address).
- Each successive COMMREQ is directed to the same channel number.

To avoid using up all TCP connections, set the number of repetitions (COMMREQ word 9) to two (2) and set the read/write period (COMMREQ words 10 and 11) to be very large, for example, 60 seconds. With these parameters the ladder program will issue the first COMMREQ, wait for the COMMREQ Status (CRS) word to turn to 1, then issue the next COMMREQ, wait for the CRS word to turn to 1, and so forth.

By interrupting an active channel in this way, you allow the reuse of an existing TCP connection, while a repetition count of 1 started the time-consuming TCP connection teardown immediately.

LIS Word Bits May Go To Zero With Fast PLC Scans

If your natural scan rate (as observed by the IC641 programming software status line) is less than five (5) milliseconds, you may observe the LAN Interface Status (LIS) bits occasionally transitioning to zero (0). If this is occurring, first write a maximum scan time trap into your ladder application to determine the *maximum* scan time for your application; to work around this problem, set a constant sweep time to 10 milliseconds or to twice your maximum scan time, whichever is greater.

Determining your maximum scan time is important. If you set a constant sweep time that is at or below your maximum scan time and the actual scan time exceeds the constant sweep time, the PLC CPU will lock out all requests from other modules in the rack (including the Ethernet Interface). Once this occurs, the only way to reset the PLC CPU is to make it transition from RUN mode to STOP mode with the CPU toggle switch. Power cycling the PLC rack *does not* correct this PLC CPU problem.

AUI Cable Removal

Power to the PLC must be turned off whenever the transceiver cable (AUI cable) is connected or disconnected at the controller board (IC697CMM741) or at the transceiver.

Ethernet Interface PLC Restrictions

The Ethernet Interface IC697CMM741 may not be used in a IC697 PLC expansion rack. IC641 programming software release 3.02 and higher will not allow an Ethernet Interface to be configured in an expansion rack, and the Ethernet Interface will not function properly if placed there.

There may be no more than four (4) LAN Interfaces in a single PLC. This limit applies to the total number of IC697CMM721, IC697CMM731, IC697CMM741, and IC697CMM742 boards in the PLC.

CPU 788/789 Write Restrictions

When a CPU 788 or a CPU 789 is placed into STOP mode, it restricts memory access to a IC697 TCP/IP Ethernet Interface (a SVCREQ is required to be executed in RUN mode to unlock specific areas of memory). Thus, if the CPU 788/789 is a server PLC, then accesses to its memory will fail. The Ethernet Interface in the PLC with the CPU 788/789 will put an entry into its Exception Log (event 001CH, entry 2 = 0021H, entry 3 = FD02H) but no PLC Fault Table entry.

Also, if a CPU 788/789 is in a server PLC, the local subprogram memory (%L) will always be read-only, whether the CPU is in RUN or STOP mode.

Some PLC Fault Table Entries are Misleading

When looking into the PLC Fault Table, the following messages pointing to the slot of the Ethernet Interface may not provide a meaningful description of the problem:

- "LAN PROM/software mismatch; running soft Sw util"
- "Unsupported feature in configuration"
- "LAN system-software fault; resuming"
- "LAN Severe Network Problem; Attempting Recovery"

Should you see these messages in IC641 programming software, select the message and press F10 (ZOOM) or CTRL+F to display the error codes associated with the message. Then refer to the User's Manual, Chapter 6 (Troubleshooting) for an accurate explanation of the error codes.

SQE Enable

The Factory LAN Ethernet Interface (IC697CMM741) requires that the SQE test be enabled on the transceiver connecting it to the Ethernet LAN. Make sure your transceiver has SQE enabled.

Using TCP/IP Software on Older Ethernet Interfaces

The older EM7A1 hardware (44A730817-G01 R07) requires a hardware modification to supply +12Vdc to an external transceiver. If you are upgrading your EM7A1 from using MMS-Ethernet software to TCP/IP software, your Ethernet Interface may need to be modified or replaced.

GSM Operation With Other Network Software

The GSM PC software cannot operate if the Pathways network access software from Wollongong is already installed. A separate AUTOEXEC.BAT, CONFIG.SYS, and PROTOCOL.INI for each is required. There may also be conflicts with other network access as well. It is recommended that the PC running the GSM have no other network access software running on it.

Multiple GSMs on same network

The GSM software is designed to be the sole source for downloads on a given network for a given load multicast address. If there are multiple GSMs on the same network using the same load multicast address, a request for download may never be satisfied.

PLC Power Supply Requirements

The Factory LAN Ethernet controller (IC697CMM741) requires that the PLC include a power supply which supplies ±12Vdc (IC697PWR711, -721, -724, -731, or -748) to power the external transceiver. If an externally powered transceiver is used, the power supply is not required to provide ±12Vdc; however, the Ethernet controller (IC697CMM741) may generate fault events indicating blown fuses in this case. The fuses are not really blown, but the lack of ±12Vdc makes the fuses appear blown to the firmware

New Station Manager Command: "killss"

A new station manager command has been added in this release of the IC697CMM741 TCP/IP Software. The command "killss" is used to terminate established SRTP Server endpoints. The syntax for the command is as follows:

```
killss all|<SRTP Server endpoint> [<SRTP Server endpoint> […]]
```

'`killss all`' causes all established SRTP Server endpoints to be terminated. If the endpoint numbers (as shown in the output of '`stat v`' command) are specified, only those endpoints would be terminated. This command will not terminate any endpoints which are not in ESTABLISHED state.

The "killss" command is a *modify* command; therefore, the user is required to be *logged in* before using this command. In addition, this command is intended only for maintenance and diagnostic purposes.

Problems Corrected in This Release

Problems Corrected in Release 2.03 Firmware

This section describes software defect corrections put into firmware version 2.03 (comes on IC697CMM741M, and with Field Upgrade Kit 44A731219-G07).

Subject	ID Code	Description
Improved communications with PLC CPU	Not Available	In cases when resource limitations would cause a transfer to the PLC CPU to be unsuccessful, the Ethernet firmware now retries the transfer for up to 100 ms.
End of Sweep notifications sometimes missed	57148	Under very heavy traffic conditions, the Ethernet firmware would sometimes fail to detect End of Sweep notifications from the PLC. The backplane driver interrupt service routine has been optimized to reduce the likelihood of missing these notifications.
Change c/103 from a log event to a tally	54949	This network event, indicating loss of incoming frames due to buffer exhaustion, is now reported with the MAC tally *MisdPack* rather than an exception log entry. It can occur occasionally on very busy networks.
Incorrect restart log event reason	59389	When the Ethernet Interface restarts due to certain fatal LLC errors (c/122, c/124, c/126, c/128, c/12a), it now reports the proper restart reason code: System Error restart (1/0,5)

Problems Corrected in Release 2.12 TCP/IP Software

This section describes software corrections put into TCP/IP Ethernet software version 2.12 (IC651ENS042E).

Subject	ID Code	Description
Change some TCP log events to show remote IP address	**56250**	TCP Log events that record the taking down of a TCP connection don't identify the remote host that was connected. This information is needed for system troubleshooting and is often impossible to get after the connection comes down. TCP log events (12) entry 2=10 through 1C have been updated to show the IP address of the remote node in entries 3 and 4.
PLC Fault Table description should be changed for log event 12, entry 2=19	**56537**	The inappropriate error message "Connection to remote node failed; resuming" for the log event 12/19 on the PLC Fault Table should be changed to a more relevant message "LAN I/F capacity exceeded; discarded request."
Unnecessary log events 12, entry 2=0F are generated	**57454 59024**	Reception of TCP RST signal should cause the generation of log event 12, entry 2=0F only when the TCP port is not yet opened.
TCP connection is hung in FIN-WAIT1 state	**Not Available**	TCP connection stays up forever if the TCP window size is zero when FIN (the request to terminate a TCP connection) is received.
Unnecessary log event 18, entry 2=2 are generated	**Not Available**	Do not log "*Destination Unreachable*" error if the message is a result of attempts to respond to ICMP broadcast

Restrictions and Significant Open Problems

Open Problems in Release 2.03 Firmware

This section describes known limitations in the current EPROM firmware, version 2.03.

Subject	ID Code	Description
Recurring log entries not put into PLC Fault Table after Clear	**12723**	A recurring exception condition in the Ethernet Interface that increments the counter of an existing Exception Log entry (instead of making a new entry) is not re-entered into the PLC Fault Table after the PLC Fault Table is cleared.
Garbage characters on RESTART or LOAD commands	**12732**	When the *restart* or *load* Station Manager commands are used, one or more garbage characters may be output at the serial port. The garbage characters may be displayed by DEC VT-100 terminals. This is a hardware problem with the Ethernet module itself.
Local download of RAM software may hang	**12940**	The Software Load utility does not contain a timeout for local (serial) downloads of the RAM software from the GSM. If the local download is interrupted (e.g. - cable disconnect), the Ethernet Interface must be restarted to recover. Also, if the *ldsrc* Soft Switch is set to ALT (i.e. - alternate between local and network download sources), any character entered at the serial port when the board is soliciting a local download causes the board to remain in local download mode; the Ethernet Interface must be restarted to recover.
Remote CHSOSW needs extra <CR>	**22184**	The *chsosw* Station Manager command when used with the *rem* (REMote) command does not display its output until the next carriage return (<CR>). This can cause the command output to become garbled with the output of the next remote Station Manager command. Se related GSM EPR 13021 below.
LIS word bits may transition falsely	**25838**	False transitions of active LAN Interface Status (LIS) word bits may be detected by the PLC ladder program when the PLC sweep duration is short. For CPU firmware before v5.50, this will occur for sweeps of 2 ms or less. For later CPU firmware this may occur for sweeps of 3 ms or less. See *Special Operational Notes* above for a workaround.
LIS goes to zero with fast scan	**30613**	If the PLC CPU has a natural scan rate less than 5 milliseconds, the LAN Interface Status (LIS) bits may occasionally go to zero. See *Special Operational Notes* above for a workaround.

Open Problems in Release 2.03 Firmware-Continued

Subject	ID Code	Description
Changing IP address does not always restart Ethernet Interface	**30629**	When changing the IP address of the Ethernet Interface from all zeroes to a non-zero address, the Ethernet Interface does not always restart itself to use the new configuration data.
Many large data transfers may get errors	**30640**	Due to a limitation of internal RAM on the Ethernet Interface, many transfers of large amounts of data (reading or writing) may get errors. This is especially true for multiple TCP connections transferring at least 1024 bytes each.
Long PLC scan times impact channel performance	**62259**	When the PLC scan time exceeds 100 ms, channels may fail with error codes 2411, 0B11, 9B90, 3F11, or 9590. The error codes may be viewed by doing a Stat H command.

Open Problems in Release 2.12 TCP/IP Software

This section describes known limitations in the current TCP/IP Ethernet software (IC651ENS042E/CE651ENS042E), version 2.12.

Subject	ID Code	Description
Cannot redefine channel when 16 active	**29729**	When (the maximum) sixteen (16) channels are operating, the ladder program cannot send a new COMMREQ trying to redefine what a channel should be doing. The ladder must first abort a channel before issuing the new read or write COMMREQ.
Duplicate IP address detection puts misleading PLC Fault Table message	**29747**	If the TCP/IP software detects that there are two stations on the network with the same IP address, the PLC Fault Table message for this error is "Bad remote application request". This is misleading and should be changed to more meaningful text.
Unpredictable results if 2 COMMREQs for same channel issued	**30264**	If a ladder program issues a COMMREQ, then issues a second COMMREQ for that same channel *before the COMMREQ Status Word for the first COMMREQ has been updated*, the user cannot be certain which COMMREQ is being performed. This is a ladder programming error.
TCP connections linger beyond channel life	**30434**	When a channel is aborted, the underlying TCP connection remains for a short period. This is to perform the protocol with the remote node to allow an orderly shutdown. Ladder redefining an existing channel to communicate with a different IP address will see noticeable delays.
Excessive error logs when using wrong subnet mask	**31184**	While operating with a subnet mask value set differently than the actual subnet to which you are connected, the TCP/IP software may tally a very high level of missed packets (MAC tally *MisdPack).*
Internal buffers can be exhausted by channel retasking	**62253**	If a channel is restarted via retasking, a buffer may be lost Continual retasking will eventually result in loss of all buffers and should be avoided. Restarting the Ethernet Interface will free the buffers.

Open Problems in Release 2.14 GSM Software

This section describes known limitations in the current GSM software, version 2.14.

Subject	ID Code	Description
Reset during local load causes long delay	**12132**	If the GSM local downloader is started before the LAN Controller requests a load, and the LAN Controller is reset, there may be a lengthy delay after the LAN Controller startup cycle before the GSM actually initiates the next local download.
No XID response from GEFNDIS	**12810**	The GEFNDIS LLC Driver does not generate an XID Response frame when an XID frame is received (IEEE 802.3 networks only).
Ctrl-C of GSM makes next start-up fail	**12882**	When the GSM is exited via ^C (Ctrl-C), the GEFNDIS driver may be unable to activate LSAP upon subsequent start-up. The PC must be rebooted to recover. This problem does not occur if the GSM is exited normally via the<Esc> key or main menu selection.
Repeated send errors stop network download	**12900**	If the GSM downloader encounters repeated errors when sending a frame to the network, the GSM will indicate a Data Link Error (code = 7) and halt network download. Must exit to DOS and restart the GSM to recover.
Remote CHSOSW needs extra <CR>	**13021**	The *chsosw* Station Manager command when used with the *rem* (REMote) command does not display its output until the next carriage return (<CR>). This can cause the command output to become garbled with the output of the next remote Station Manager command. See related PROM EPR 22184 above.
Network Station Manager has fewer display lines than Local	**23093**	The Network Station Manager screen accommodates only 21 lines, instead of 22 lines like the Local Station Manager screen. Thus, a full-page Test Report will scroll off the top of the Network Station Manager screen.
GSM cannot coexist with Pathways	**25568**	The GSM does not operate over an Ethernet network when Wollongong Pathways is also installed in the same PC.

Changes and Additions to the User's Manual

The information below amends the corresponding pages in the *TCP/IP Ethernet Communications for the IC697 PLC User's Manual*.

Table 6-10. Exception Log Event Codes

Log Event Code	Possible Cause and Resolution
Event "c" LLC events	(Remove the entry for Entry 2 = 103).

Log Event Code	Possible Cause and Resolution
Event "12" TCP events	This event is logged by the TCP layer. **Entry 1** will always be zero. **Entry 2** identifies the type of error: 10 "Connection to remote node failed; resuming" This error is reported when a TCP connection has been aborted. The TCP layer has retransmitted a segment the maximum number of times and the remote host has failed to ACK the segment. Check network connectivity and the remote host's operational status. **Entries 3 & 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 3.0.0.1 would be shown as 0300H 0001H. **Entry 5** is the number of transmission attempts. 11 "Connection to remote node failed; resuming" This error is reported when a connection has been aborted after the remote host failed to respond to "keep-alive" probes. Check network connectivity and the remote host's operational status. **Entries 3 & 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 3.0.0.1 would be shown as 0300H 0001H. **Entry 5** is the TCP state of the connection: 1 = CLOSED 2 = LISTEN 3 = SYN-SENT 4 = SYN-RECEIVED 5 = ESTABLISHED 6 = FIN-WAIT-1 7 = FIN-WAIT-2 8 = CLOSE-WAIT 9 = LAST-ACK 10 = CLOSING 11 = TIME-WAIT 12 "Connection to remote node failed; resuming" This error is reported when an SYN has arrived in an improper state. If the error persists, verify that applications are using properly IP addresses and that the remote host is not experiencing resource limitations. **Entries 3 & 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 3.0.0.1 would be shown as 0300H 0001H. The lower byte of **Entry 5** is the connection state (See error code 11 above.), and

Log Event Code	Possible Cause and Resolution
	the upper byte is the offending field value. 13 "LAN system - software fault; resuming" Internal error: An attempt to bind a remote TCP/IP endpoint to a TCP connection failed because a connection was already open to that endpoint. **Entries 3 & 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 3.0.0.1 would be shown as 0300H 0001H. **Entry 5** is the local TCP port number. **Entry 6** is the TCP port number on the remote node. 14 "LAN PROM/software mismatch; running soft Sw util" Internal error: A memory allocation error occurred while attempting to open a server connection requested by a remote node. **Entries 3 & 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 3.0.0.1 would be shown as 0300H 0001H. **Entry 5** is the local TCP port number. **Entry 6** is the TCP port number on the remote node. 15 "LAN PROM/software mismatch; running soft Sw util" Internal error: An error occurred while attempting to send a reply when a server connection was requested by a remote node. **Entries 3 & 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 3.0.0.1 would be shown as 0300H 0001H. **Entry 5** is an internal software error code. 16 "LAN PROM/software mismatch; running soft Sw util" Internal error: The software attempted to deallocate data for a TCP connection before the connection was closed. **Entries 3 & 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 3.0.0.1 would be shown as 0300H 0001H. **Entry 5** is the TCP state of the connection (See error code 11 above.). 17 "Connection to remote node failed; resuming" A packet was received with an inappropriate field value for the current state of the TCP connection. RST was sent to the remote endpoint. **Entries 3 & 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 3.0.0.1 would be shown as 0300H 0001H. The lower byte of **Entry 5** is the connection state (See error code 11 above.), and the upper byte is the offending field value. 18 "Connection to remote node failed; resuming" A SYN packet was received when an ACK was expected. RST was sent to the remote endpoint. **Entries 3 & 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 3.0.0.1 would be shown as 0300H 0001H. The lower byte of **Entry 5** is the connection state (See error code 11 above.), and the upper byte is the offending field value. 19 "LAN I/F capacity exceeded; discarded request" A remote node attempted to establish a new TCP connection when all 16 connections were already in use. RST was sent to the remote endpoint. **Entries 3 & 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 3.0.0.1 would be shown as 0300H 0001H. The lower byte of **Entry 5** is the connection state (See error code 11 above.), and the upper byte is the offending field value. 1B "Connection to remote node failed; resuming" Unable to establish a connection to a remote node because the internal listen queue is full. **Entries 3 & 4** are the IP address of the remote host displayed as two hexadecimal words. For example, 3.0.0.1 would be shown as 0300H 0001H. **Entry 5** is the local port number.

Chapter 5 The Station Manager

Section 3: Command Description

KILLSS Command

Note

This command is intended to be used only for diagnostics and maintenance.

The KILLSS command has the form:

KILLSS ALL|<SRTP Server endpoint> [<SRTP Server endpoint> […]]

The *KILLSS* command causes the specified SRTP Server endpoint to be terminated. The endpoint is identified by a number as listed in the leftmost column of the output of the *STAT V* station manager command. Alternately, the keyword *ALL* may be used instead of an endpoint identifier. In this case, all established SRTP Server endpoints will be terminated. Only endpoints which are in ESTABLISHED state can be terminated by this command.

A typical *KILLSS* command is shown below:

```
= KILLSS 2

SRTP Server endpoint 2 shut down initiated
```